1. A method to increase GMR signal strength, comprising:

providing a GMR stack having, on its top surface, a bias cancellation layer located between opposing hard magnetic layers;

removing portions of said bias cancellation layer, said removed portions extending inwards a distance from said hard magnetic layers: and

covering said magnetic layers and removed portions with a layer of insulation whereby current through said device is constrained to flow through its central area.

2. The method described in claim 1 wherein said bias cancellation layer further comprises an antiferromagnetic layer on an exchange dilution layer.

3. The method described in claim 1 wherein said distance that said removed portions extend inwards from said hard magnetic layers is between about 0.01 and 0.2 microns.

4. The method described in claim 1 wherein said hard magnetic layer is selected from the group consisting of CoCrPt, CoCr, CoCrTa, CoCrPtTa, and CoCrNi.

5. The method described in claim 1 wherein said bias cancellation layer is deposited to a thickness between about 30 and 150 Angstroms.

6. The method described in claim 1 wherein said GMR stack has a signal strength of between about 1 and 20 %.

between about 1 and 20 %.

7. A process to manufacture a CPP magnetic read head, comprising:

providing a substrate and forming thereon a lower lead layer;

depositing GMR layers, having a first top surface, on said lower lead layer;

depositing an exchange dilution layer on said first top surface followed by an antiferromagnetic layer, said exchange dilution layer and said antiferromagnetic layer together constituting a bias cancellation layer having a second top surface;

patterning said bias cancellation and GMR layers to form a GMR stack having sloping sidewalls;

depositing a first dielectric layer on said lower lead layer and on said sidewalls;

selectively depositing a hard magnetic layer on only said first dielectric layer;

then forming on said second top surface a liftoff mask that covers a reduced length of said second top surface, leaving uncovered portions of said antiferromagnetic layer that extend inwards a distance from said hard magnetic layer;

depositing a second dielectric layer and then lifting off said mask, thereby exposing said reduced length bias cancellation layer; and

then depositing an upper lead layer on all exposed surfaces.

8. The process described in claim 7 wherein said antiferromagnetic layer is selected from the group consisting of IrMn, NiMn, PtMn, FeMn, and PdPtMn.

9. The process described in claim 7 wherein said exchange dilution layer is selected from the group consisting of Cu, Ru, Ta, Rh, and laminates thereof.

10. The process described in claim 7 wherein said exchange dilution layer is deposited to a thickness between about 5 and 20 Angstroms.

11. The process described in claim 7 wherein said reduced length bias cancellation layer is between about 0.01 and 0.2 microns long.

12. The process described in claim 7 further comprising a step of magnetizing said hard magnetic layers whereby there is a magnetic field of between about 500 and 2,000 Oe at an inner edge of said hard magnetic layer and between about 50 and 500 Oe midway between said inner edges.

13. The process described in claim 7 wherein said distance that said uncovered portions extend inwards from said hard magnetic layers is between about 0.01 and 0.2 microns.

14. The process described in claim 7 wherein said hard magnetic layer is selected from the group consisting of CoCrPt, CoCr, CoCrTa, CoCrPtTa, and CoCrNi.

15. The process described in claim 7 wherein said bias cancellation layer is deposited to a thickness between about 30 and 150 Angstroms.

16. The process described in claim 7 wherein said CPP magnetic read head has a signal strength of between about 10 and 100 % greater than similar prior art devices.

17. A GMR stack having sidewalls and an upper surface, comprising:

in addition to the GMR stack itself, opposing hard magnetic layers that lie on said sidewalls and are separated by a gap;

on said upper surface in said gap, a bias cancellation layer having two opposing ends, each of which terminates a finite distance from one of said hard magnetic layer; and

said magnetic layers and removed portions being covering with a layer of insulation whereby current through said GMR stack is constrained to flow through its central area.

18. The GMR stack described in claim 17 wherein said bias cancellation layer further comprises an antiferromagnetic layer on an exchange dilution layer.

19. The GMR stack described in claim 17 wherein each distance from one of said hard magnetic layers is between about 0.01 and 0.2 microns.

20. The GMR stack described in claim 17 wherein said hard magnetic layer is selected

from the group consisting of CoCrPt, CoCr, CoCrTa, CoCrPtTa, and CoCrNi.

21. The GMR stack described in claim 17 wherein said bias cancellation layer has a thickness between about 30 and 150 Angstroms.

22. The GMR stack described in claim 17 wherein said GMR stack has a signal strength of between about 1 and 20 %.

23. A CPP magnetic read head, comprising:

a substrate and forming thereon a lower lead layer;

a GMR stack, having a first top surface and sloping sidewalls, on said lower lead layer;

an antiferromagnetic layer on an exchange dilution layer which is on said first top surface and, said exchange dilution layer and said antiferromagnetic layer together constituting a bias cancellation layer having a second top surface;

a first dielectric layer on said lower lead layer and on said sidewalls;

opposing hard magnetic layers, separated by a gap, on only said first dielectric layer;

said bias cancellation layer having two opposing ends, each of which terminates a finite distance from one of said opposing hard magnetic layers;

a second dielectric layer on only said hard magnetic layers and on those portions

of said first top surface not contacting said bias cancellation layer; and

an upper lead layer on said bias cancellation layer and said second dielectric layer.

24. The magnetic read head described in claim 23 wherein said antiferromagnetic layer is selected from the group consisting of IrMn, NiMn, PtMn, FeMn, and PdPtMn.

25. The magnetic read head described in claim 23 wherein said exchange dilution layer is selected from the group consisting of Cu, Ru, Ta, Rh, and laminates thereof.

26. The magnetic read head described in claim 23 wherein said exchange dilution layer has a thickness between about 5 and 20 Angstroms.

27. The magnetic read head described in claim 23 wherein said opposing ends of the bias cancellation layer are between about 0.01 and 0.2 microns apart.

28. The magnetic read head described in claim 23 wherein there is a magnetic field of between about 500 and 2,000 Oe at an inner edge of said hard magnetic layer and between about 50 and 200 Oe midway between said inner edges.

29. The magnetic read head described in claim 23 wherein said distance from one of said opposing hard magnetic layers is between about 0.01 and 0.2 microns.

30. The magnetic read head described in claim 23 wherein said hard magnetic layer is selected from the group consisting of CoCrPt, CoCr, CoCrTa, CoCrPtTa, and CoCrNi.

31. The magnetic read head described in claim 23 wherein said bias cancellation layer has a thickness between about 30 and 150 Angstroms.

32. The magnetic read head described in claim 23 wherein said read head has a signal strength of between about 10 and 100 % greater than similar devices of the prior art.